

**CLAIMS:**

1. A combustible pellet comprising municipal solid waste, said pellet having a water content of less than 10% by weight and a fuel value of at least 10,000 BTU per pound
2. The pellet of Claim 1 which additionally comprises at least one waste substance of high fuel value, to increase the fuel value of the pellet formed from municipal solid waste, the resultant pellet having a fuel value of at least 10,000 BTU per pound.
3. The pellet of Claim 2 in which the waste substance of high fuel value is selected from hydrocarbon material, safe industrial waste, commercial and institutional waste, wood, rubber, fibrous material and other waste having a fuel value of at least 10000 BTU per pound.
4. The pellet of Claim 2 in which the waste substance of high fuel value is selected from the group consisting of hydrocarbons, carbon, safe industrial waste, commercial and institutional waste, carpet, underlay, vinyl flooring, rubbers, tires, automotive insulation, compost residue, coal dust, fabrics, leather, furniture, peat, hemp, jute, sugarcane, coconut husks, corn husks, rice hulls, sewage sludges, wood and paper fibres, and mixtures thereof.
5. The pellet of Claim 4 in which the hydrocarbon is petroleum coke, the carbon is bottom ash, the rubber is synthetic rubber, the wood is selected from the group consisting of bark, chips, sawdust, plywood, particle board, pallets, skids, bush, tree branches and yard waste, and fibres are selected from the group consisting of corrugated cardboard, newspaper, packaging, box board, aseptic board and pulp sludges.
6. The pellet of Claim 1 in which the pellet is in the form of compacted fluff.

7. The pellet of Claim 1 in which the municipal solid waste is free of recyclable materials.

5 8. The pellet of Claim 1 in which the municipal solid waste is free of substances selected from the group consisting of glass, metals, plastics and paper.

10 9. The pellet of Claim 2 in which the emissions released from combustion of the pellet are less than  $17 \text{ mg/Rm}^3$  of particulate matter, less than  $14 \text{ } \mu\text{g/Rm}^3$  of cadmium, less than  $142 \text{ } \mu\text{g/Rm}^3$  of lead, less than  $20 \text{ } \mu\text{g/Rm}^3$  of mercury, less than  $0.14 \text{ ng/Rm}^3$  of dioxin/furan, less than  $27 \text{ mg/Rm}^3$  of hydrochloric acid, less than  $56 \text{ mg/Rm}^3$  of sulphur dioxide and less than 110 ppmv of nitrogen oxides.

15 10. The pellet of Claim 1 which, on combustion at a temperature of  $1150^\circ\text{C}$  in air, has a bottom ash content of less than 10% by weight.

20 11. The pellet of Claim 10 in which the fuel value is at least 12,000 BTU per pound.

12. The pellet of Claim 11 in which the fuel value is in the range of 12500-14000 BTU per pound.

25 13. The pellet of Claim 11 in which the fuel value is at least 14,000 BTU per pound.

14. The pellet of Claim 2 in which the water content is in the range of 1-7 percent by weight.

30 15. The pellet of Claim 2 in which the pellet has a length of at least 3 cm and a width of at least 1 cm.

16. The pellet of Claim 15 in which the pellet has a length of 5-15 cm and a width of 3.5-8 cm.

5 17. The pellet of Claim 2 in which the cross-section of the pellet is substantially circular.

18. A process for forming a combustible pellet from municipal solid waste, comprising the steps of:

- 10 a) removing solid hazardous waste from said municipal solid waste;
- b) subjecting the municipal solid waste so obtained to at least one step to separate recyclable products therefrom;
- 15 c) subjecting the product of step (b) to a shredding and a pulverizing step, to form a fluff with a water content of less than 10% by weight; and
- d) compacting the fluff to form a combustible pellet.

20 19. The process of Claim 18 in which an additional step of anaerobic digestion follows step (b).

20. The process of Claim 19, wherein digestion takes about 15 to 25 days.

25 21. The process of Claim 19 or Claim 20, wherein gas is produced from digestion.

22. The process of Claim 21, wherein the gas drives a gas-fired turbine engine.

30 23. The process of Claim 21, wherein the gas is used to dry the waste.

24. The process of Claim 18 or Claim 19 in which the pellet so obtained has a fuel value of at least 10,000 BTU per pound.

5 25. The process of Claim 24 in which, in (b), the municipal solid waste is subjected to at least one step to remove glass, metal, plastic and newspaper therefrom.

26. The process of Claim 25 in which at least one waste substance of high fuel value is added prior to step (c).

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27. The process of Claim 26 in which the waste substance of high fuel value is selected from hydrocarbon material, safe industrial waste, commercial and institutional waste, wood, rubber, fibrous material and other waste having a fuel value of at least 10000 BTU per pound.

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28. The process of Claim 26 in which prior to step (c) at least one waste substance selected from the group consisting of the waste substance of high fuel value is selected from the group consisting of hydrocarbons, carbon, safe industrial, commercial and institutional waste, carpet, underlay, vinyl flooring, rubbers, tires, automotive insulation, compost residue, coal dust, fabrics, leather, furniture, peat, hemp, jute, sugarcane, coconut husks, corn husks, rice hulls, sewage sludges, wood and paper fibres, and mixtures thereof, is added to the municipal solid waste.

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25 29. The process of Claim 26 in which the hydrocarbon is petroleum coke, the carbon is bottom ash, the rubber is synthetic rubber, the wood is selected from the group consisting of bark, chips, sawdust, plywood, particle board, pallets, skids, bush, tree branches and yard waste, and fibres are selected from the group consisting of corrugated cardboard, newspaper, packaging, box board and aseptic board, and pulp sludges.

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30. The process of Claim 26 in which the pellet is in the form of compacted fluff.

5 31. The process of Claim 26 in which the municipal solid waste is free of recyclable materials.

32. The process of Claim 26 in which the municipal solid waste is free of substances selected from the group consisting of glass, metals, plastics and paper.

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33. The process of Claim 26 in which the emissions released from combustion of the pellet are less than 17 mg/Rm<sup>3</sup> of particulate matter, less than 14 µg/Rm<sup>3</sup> of cadmium, less than 142 µg/Rm<sup>3</sup> of lead, less than 20 µg/Rm<sup>3</sup> of mercury, less than 0.14 ng/Rm<sup>3</sup> of dioxin/furan, less than 27 mg/Rm<sup>3</sup> of hydrochloric acid, less than 56 mg/Rm<sup>3</sup> of sulphur dioxide and less than 110 ppmv of nitrogen oxides.

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34. The process of Claim 26 in which, on combustion at a temperature of 1150°C in air, the pellet has a bottom ash content of less than 10% by weight.

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35. The process of Claim 26 in which the fuel value of the pellet so obtained is at least 12,000 BTU per pound.

36. The process of Claim 35 in which the fuel value of the pellet so obtained is in the range of 12500- 14000 BTU per pound.

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37. The process of Claim 35 in which the fuel value of the pellet so obtained is at least 14,000 BTU per pound.

38. The process of Claim 26 in which the water content of the pellet so obtained is in the range of 1-7 percent by weight.

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39. The process of Claim 26 in which the pellet so obtained has a length of at least 3 cm and a width of at least 1 cm.
40. The process of Claim 39 in which the pellet so obtained has a length of 5-15 cm and a width of 3.5-8 cm.
41. The process of Claim 26 in which the cross-section of the pellet so obtained is substantially circular.
- 10 42. The process of Claim 26 in which the amount of municipal solid waste and the amount of said additional waste substance is controlled so that the pellet so obtained as a fuel value of at least 10,000 BTU per pound.